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DATE MAILED: 03/10/2006

APPLICATION NO.	FI	LING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/829,053 04/21/2004		04/21/2004	Sanjeev Aggarwal	TI 35817	6820
. 23494	7590	03/10/2006	EXAMINER		
TEXAS IN P O BOX 65		ENTS INCORPOR	CHAUDHARI, CHANDRA P		
DALLAS, TX 75265				ART UNIT	PAPER NUMBER
				2891	<u></u>

Please find below and/or attached an Office communication concerning this application or proceeding.

		Application No.	Applicant(s)			
Chandra Chauchari  Period for Reply  A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.  Entensive for item may be available under the processes of JOFR 1.73(b), in no event, however, may nearly be timen filed  If NO period for regly is specified dates, the maximum stabilary period will apply and will expert SIX (5) MONTH from the mailing date of the communication.  Fhails to Reply within the soft or entended period for regly with statute, cause the explositation to become ABANDCRED (50 J.C. § 133).  Fhails to Reply within the soft or entended period for regly with statute, cause the explositation to become ABANDCRED (50 J.C. § 133).  Status  1) □ Responsive to communication(s) filled on 16 December 2005.  2a) □ This action is FINAL. 2b) □ This action is non-final.  3) □ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under Ex parte Quayle, 1935 C.D. 11, 453 O.G. 213.  Disposition of Claims  4) □ Claim(s) 1-5.7-13.17-21.23-30 and 32 Is/are pending in the application.  4a) □ Of the above claim(s) is/are allowed.  3□ □ Claim(s) 1-5.7-13.17-21.23-30 and 32 Is/are rejected.  7□ □ Claim(s) 1-5.7-13.47-21.23-30 and 32 Is/are rejected.  7□ □ Claim(s) 1-5.7-13.67-21.23-30 and 32 Is/are rejected.  7□ □ Claim(s) 1-5.7-13.67-21.23-30 and 32 Is/are rejected.  7□ □ Claim(s) 1-5.7-13.67-21.23-30 and 32 Is/are rejected.  9□ □ The specification is objected to by the Examiner.  9□ □ The drawing(s) filled on is/are: a)   accepted or b)   objected to by the Examiner.  Application Papers  9□ □ The drawing(s) filled on is/are: a)   accepted or b)   objected to by the Examiner.  Application Papers  10□ □ The drawing(s) filled on is/are: a)   a		10/829,053	AGGARWAL ET AL.			
Preind for Reply A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.  WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.  **Beamers of time may be available under the provisions of 37 CFR 1.18(d), in no avent, however, may a reply be timely filled.  **If NO period for reply is specified above, the maximum shallebury priends will apply and will expire \$1X, (8) MONTHS from the malling date of this communication.  **Patible to prove within the set or cardend period for reply will, by batted, cause the application to Decoma PARNONEO (35 U.S.C. § 133).  Any reply received by the Office laber than three months after the malling date of this communication, aven if timely filled, may reduce any camera plant in an applicant.  **Patible to preve within the set or 62.7 CFR 1.7969.  **Status**  1) □ Responsive to communication(s) filled on 16 December 2005.  2a) □ This action is FINAL.  2b) □ This action is condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under Ex parte Quayle, 1935 C.D. 11, 453 O.G. 213.  Disposition of Claims  4) □ Claim(s) 1-5.7-13.17-21.23-30 and 32 is/are pending in the application.  4a) ○ Claim(s) 1-5.7-13.17-21.23-30 and 32 is/are rejected.  7b □ Claim(s) 1-5.7-13.77-21.23-30 and 32 is/are rejected.  7c □ Claim(s) 1-5.7-13.77-21.23-30 and 32 is/are rejected.  7c □ Claim(s) 1-5.7-13.77-21.23-30 and 32 is/are rejected.  7d □ Claim(s) 1-5.7-13.77-21.23-30 and 32 is/are rejected.  7d □ Claim(s) 1-5.7-13.77-21.23-30 and 32 is/are rejected.  7d □ Claim(s) 1-5.7-13.77-21.23-30 and 32 is/are rejected.  7e) □ The specification is objected to by the Examiner.  10) □ The drawing(s) filed on 1-15.8-15.8-15.8-15.8-15.8-15.8-15.8-15.	Office Action Summary	Examiner	Art Unit			
Period for Reply  A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.  - the SU (8) MONTH'S from the mailing date of this communication.  - If No period for reply is specified above, the maximum statusor period valley and will expire X(8) (MONTH'S from the mailing date of this communication.  - Failure to reply within the set or extended period for reply vell. by status, cause the application to become ABMODOED (35 U.S. C, § 133).  - Failure to reply within the set or extended period for reply vell. by status, cause the application to become ABMODOED (35 U.S. C, § 133).  - Failure to reply vell in the set of certended period for reply vell. by status, cause the application to become ABMODOED (35 U.S. C, § 133).  - Failure to reply vell in the set of certended period for reply vell. by status, cause the application to become ABMODOED (35 U.S. C, § 133).  - Status  1)  Responsive to communication(s) filed on 16 December 2005.  2a)  This action is FINAL.  2b)  This action is non-final.  3)  Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under Ex parte Quayle, 1935 C.D. 11, 453 O.G. 213.  Disposition of Claims  4)  Claim(s)		Chandra Chaudhari	2891			
A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.  Leace-lines of them map be available under the provincion of 30° CRT-136°, in no event, however, way a rays by the timoty filled.  * If NO period for reply is specified above, the maximum stabildory period will exply and will lead to \$10.00 (\$1.0		ppears on the cover sheet with the	e correspondence address			
2a) This action is FINAL. 2b) This action is non-final.  3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under Ex parte Quayle, 1935 C.D. 11, 453 O.G. 213.  Disposition of Claims  4) Claim(s) 1-5.7-13.17-21.23-30 and 32 is/are pending in the application.  4a) Of the above claim(s) is/are withdrawn from consideration.  5) Claim(s) is/are allowed.  6) Claim(s) is/are objected to.  8) Claim(s) are subject to restriction and/or election requirement.  Application Papers  9) The specification is objected to by the Examiner.  10) The drawing(s) filed on is/are: a) accepted or b) objected to by the Examiner.  Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.  Priority under 35 U.S.C. § 119  12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  a) All b) Some c) None of:  1. Certified copies of the priority documents have been received.  2. Certified copies of the priority documents have been received in Application No  3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  * See the attached detailed Office action for a list of the certified copies not received.  Attachment(s)  1) Notice of Prafasperson's Patent Drawing Review (PTO-948)  3) Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  3) Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  4) Interview Summary (PTO-413)  Paper No(s)/Mail Date	A SHORTENED STATUTORY PERIOD FOR REP WHICHEVER IS LONGER, FROM THE MAILING I  - Extensions of time may be available under the provisions of 37 CFR 1 after SIX (6) MONTHS from the mailing date of this communication.  - If NO period for reply is specified above, the maximum statutory period  - Failure to reply within the set or extended period for reply will, by statu Any reply received by the Office later than three months after the mailine earned patent term adjustment. See 37 CFR 1.704(b).	DATE OF THIS COMMUNICATION  .136(a). In no event, however, may a reply be divill apply and will expire SIX (6) MONTHS from the course the application to become ABANDO	ON. timely filed om the mailing date of this communication. NED (35 U.S.C. § 133).			
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4)	closed in accordance with the practice under	Ex parte Quayle, 1935 C.D. 11,	453 O.G. 213.			
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9)  The specification is objected to by the Examiner.  10)  The drawing(s) filed on is/are: a)  accepted or b) objected to by the Examiner.  Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  11)  The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.  Priority under 35 U.S.C. § 119  12)  Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  a)  All b)  Some * c)  None of:  1.  Certified copies of the priority documents have been received.  2.  Certified copies of the priority documents have been received in Application No  3.  Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  * See the attached detailed Office action for a list of the certified copies not received.  Attachment(s)  1)  Notice of References Cited (PTO-892)  2)  Notice of Parisperson's Patent Drawing Review (PTO-948)  3)  Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  Paper No(s)/Mail Date  5)  Notice of Informal Patent Application (PTO-152)  Paper No(s)/Mail Date  5)  Notice of Informal Patent Application (PTO-152)  (B)  Other:	4a) Of the above claim(s) is/are withdra 5) ☐ Claim(s) is/are allowed. 6) ☑ Claim(s) 1-5,7-13,17-21,23-30 and 32 is/are 7) ☐ Claim(s) is/are objected to.	awn from consideration.				
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12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  a) All b) Some * c) None of:  1. Certified copies of the priority documents have been received.  2. Certified copies of the priority documents have been received in Application No  3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  * See the attached detailed Office action for a list of the certified copies not received.  Attachment(s)  1) Notice of References Cited (PTO-892)  2) Notice of Draftsperson's Patent Drawing Review (PTO-948)  3) Interview Summary (PTO-413) Paper No(s)/Mail Date  5) Notice of Informal Patent Application (PTO-152) Paper No(s)/Mail Date	Priority under 35 U.S.C. & 119					
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Unice Action Summary Part of Pager No (Mail Date Vitibitities	1) Notice of References Cited (PTO-892) 2) Notice of Draftsperson's Patent Drawing Review (PTO-948) 3) Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08 Paper No(s)/Mail Date  J.S. Patent and Trademark Office	Paper No(s)/Mail I  5) Notice of Informal  6) Other:	Date			

Art Unit: 2891

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-2, 5, 7-13, 17-18, 21, 23-30, 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nagata – US 6,232,174 and Grieger – US 5,855,811.

Nagata (Figs. 2A-2F and text in col. 4, lines 2-64, and col. 8, line 41 to col. 9, line 62) discloses substantially the claimed invention by manufacturing a ferroelectric random access memory with a transistor having source/drain regions 4, interlevel dielectric layer 5 with conductive plug 6, forming 1<sup>st</sup> electrode 7, forming 2<sup>nd</sup> electrode 11 over the planarized ferroelectric dielectric layer 8. Nagata does not disclose to clean the planarized ferroelectric dielectric layer, nor planarizing and cleaning the electrodes. Greiger (abstract, and col. 1, lines 13-41, and col. 2, lines 13-65) teaches to planarize layers and clean during semiconductor fabrication.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to planarize and clean each layer as taught by Grieger in Nagata's process to build up uniform layers which economizes on process time and cost and clean the planarization residue from the surface to efficiently make contact with subsequent layers.

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Claims 3-4, 19-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nagata and Grieger as applied to claims 1-2, 5, 7-13, 17-18, 21, 23-30, 32 above, and further in view of either (Suenaga - US 6,239,457 or Suh - US 6,338,970).

Nagata and Grieger are applied as above and do not disclose the ferroelectric dielectric layer having an average surface roughness of less than about 0.5 nm. Either (Suenaga (Fig. 7A and col. 7, lines 1-49) or Suh (Fig. 2A-2C and col.2, line 49 to col. 3, line 37)) teaches to form a ferroelectric dielectric layer with an average surface roughness of less than about 0.5 nm.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to form a ferroelectric dielectric layer with an average surface roughness of less than about 0.5 nm as taught by either (Suenaga or Suh) in (Nagata and Grieger's process) to decrease leakage current and increase breakdown voltage.

Claims 1-2, 5, 7, 12-13, 17-18, 21, 23, 28-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nagata - US 6,232,174 and Lee - US 2002/0003123.

Nagata (Figs. 2A-2F and text in col. 4, lines 2-64, and col. 8, line 41 to col. 9, line 62) discloses substantially the claimed invention by manufacturing a ferroelectric random access memory with a transistor having source/drain regions 4, interlevel dielectric layer 5 with conductive plug 6, forming 1<sup>st</sup> electrode 7, forming 2<sup>nd</sup> electrode 11 over the planarized ferroelectric dielectric layer 8. Nagata does not disclose to clean the ferroelectric dielectric layer. Lee (Fig. 1 and paragraphs 38-41) teaches to clean the ferroelectric dielectric layer prior to forming the 2<sup>nd</sup> electrode layer.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to clean the ferroelectric dielectric layer as taught by Lee in Nagata's process to remove damaged portions, thereby reducing leakage current.

Art Unit: 2891

Claims 3-4, 19-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nagata and Lee as applied to claims 1-2, 5, 7, 12-13, 17-18, 21, 23, 28-30 above, and further in view of either (Suenaga - US 6,239,457 or Suh - US 6,338,970).

Nagata and Lee are applied as above and do not disclose the ferroelectric dielectric layer having an average surface roughness of less than about 0.5 nm. Either (Suenaga (Fig. 7A and col. 7, lines 1-49) or Suh (Fig. 2A-2C and col.2, line 49 to col. 3, line 37)) teaches to form a ferroelectric dielectric layer with an average surface roughness of less than about 0.5 nm.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to form a ferroelectric dielectric layer with an average surface roughness of less than about 0.5 nm as taught by either (Suenaga or Suh) in (Nagata and Lee's process) to decrease leakage current and increase breakdown voltage.

Applicant's arguments with respect to claims 1-5, 7-13, 17-21, 23-30, and 32 have been considered but are moot in view of the new ground(s) of rejection.

Application/Control Number: 10/829,053

Art Unit: 2891

Any inquiry concerning this communication or earlier communications from the examiner

should be directed to Chandra Chaudhari whose telephone number is 571-272-1688. The examiner

can normally be reached on Mon - Fri (9:00-5:30).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bill

Baumeister can be reached on 571-272-1722. The fax phone number for the organization where this

application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application

Information Retrieval (PAIR) system. Status information for published applications may be obtained

from either Private PAIR or Public PAIR. Status information for unpublished applications is available

through Private PAIR only. For more information about the PAIR system, see http://pair-

direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the

Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Chandra Chaudhari

Primary Examiner

Art Unit 2891

Chandra Chaudhari

C. Chaushari

March 3, 2006